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Snorri Björn Sigurðsson,
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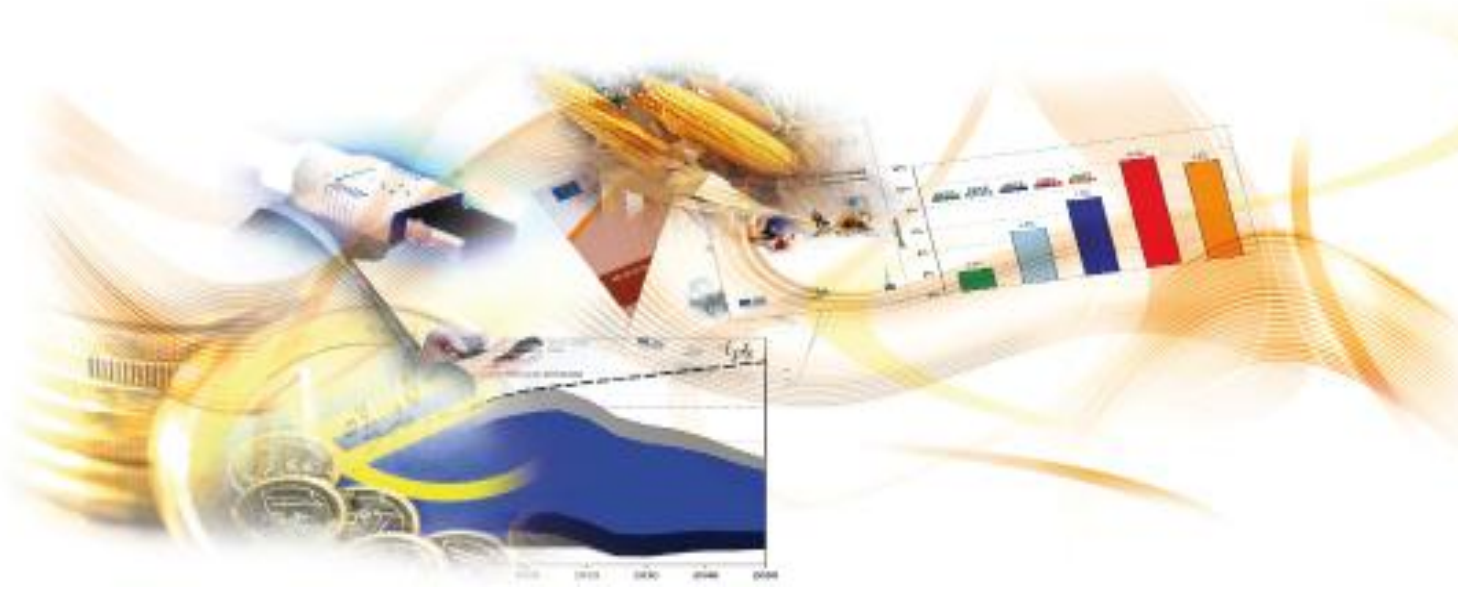

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Joint Research Centre

European Commission
Joint Research Centre
Institute for Prospective Technological Studies

Contact information
Address: Edificio Expo. c/ Inca Garcilaso, 3. E-41092 Seville (Spain)
E-mail: jrc-ipts-secretariat@ec.europa.eu
Tel.: +34 954488318
Fax: +34 954488300

http://ipts.jrc.ec.europa.eu
http://www.jrc.ec.europa.eu

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The Country Report 2012 builds on and updates the 2011 edition. The report identifies the structural challenges of the national research and innovation system and assesses the match between the national priorities and the structural challenges, highlighting the latest developments, their dynamics and impact in the overall national context.

The first draft of this report was produced in December 2012 and was focused on developments taking place in the previous twelve months. In particular, it has benefitted from the comments and suggestions of Inger Midtkandal from JRC-IPTS. The contributions and comments from Hallgrímur Jónasson and Þorvaldur Finnbjörnsson from Rannis are also gratefully acknowledged.

The report is currently only published in electronic format and is available on the ERAWATCH website. Comments on this report are welcome and should be addressed to jrc-ipts-erawatch-helpdesk@ec.europa.eu.

EXECUTIVE SUMMARY

Iceland has a fully-fledged research and innovation system. Growth of R&D activities has been significant, shifting the GERD/GDP ratio from 1.1% in 1991 to 3.1% in 2009. The country has a relatively high share of Human Resources in Science and Technology (HRST) in the economically active population, more precisely 51.3% of the labour force in Iceland in 2011, compared to 42.3% in the EU27 (Eurostat 2012) [1]
Iceland's Gross Expenditure on Research and Development (GERD) as share of GDP was 3.1% in 2009, a relatively high level compared to the EU27 average of 2.03 % (Eurostat).

Within the Icelandic research system, the Science and Technology Policy Council (STPC) is the key strategic body, on the policy design level. The role of this body is to define the country's strategic orientation for science and technology policy. The Council is organised in two committees, the Science Committee and the Technology Committee, which both prepare the decisions of the Council. There is an overlap between members of these two committees in order to foster synergies.

The individual Ministers make decisions with regards to the R&D institutions and funds that are placed under the control of their respective ministries.

On the operational level, the Icelandic Centre for Research (Rannis),reporting to the Ministry of Education, Science and Culture, is an important agent: the Centre provides professional assistance to STPC and its committees in the preparation and implementation of the science and technology policy. Rannis operates the major part of national competitive funds for science and technology.

Public funding for universities, institutions and funds have decreased by 4 billion ISK from 2008 to 2012, or by over 20% in fixed value.

As a share of the total funding for research and development the government has gone up by 2.1%, from 2007 t0 2009, while the corporations have gone down by 1.6%. Foreign funding has been little changed, for the same period, while private non-profits have gone down by 0.3%.[2] Close to 80% of public funding for research and development is tied to appropriations for institutions but less than 20% is competitive funding in 2012.

Regional or National Research and Innovation Strategies on Smart Specialisation (RIS3) has not been implemented in Iceland but is under consideration.

After the onset of the economic crisis, an international expert panel prepared a report on education, research and innovation policy in Iceland on behalf of the government. Based on this report and subsequent policy analyses, the following structural challenges facing the Icelandic research and innovation system can be identified:

- low share of private R&D investments
- low levels of competitive research funding
- insufficient research prioritisation

[1] http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tsc00025&plugin=0
[2] Research and Development in Iceland 2009 (page 15) and Research and Development in Iceland 2011 (page 24), printed booklets. Rannis. http://rannis.is/analysis/statistics-on-research-and-development/

- weaknesses in governance and
- focus on research rather than innovation

The level of private R&D investments in Iceland is believed to be low when compared to other OECD countries (Taxell report, 2009). The country has a small number of R&D-active firms, and policy measures aimed towards stimulating company R&D are perceived to be insufficient or ineffective (Taxell, 2009, p. 16).

Public research funding mainly takes the form of block grants, and it is argued that the low levels of competitive funding prevent efficient management of science and research. Increasing the levels of competitive funding would make research prioritisation easier and increase the quality of Icelandic research.

In the budget appropriations for 2013 the Research fund and the Technology development fund received additional funding for 550 million ISK each and the Strategic Research Programme received 200 million ISK. It should also be mentioned that the Tax scheme for innovative firms, started in 2010, has reached over one billion ISK in 2013. The last one is not competitive by nature, rather a right of firms fulfilling specific requirements to get significant part of its R&D expenditure, back.

Several weaknesses were pointed out by the Taxell Commission in the area of research and innovation governance, relating both to the policy making abilities of STPC, the policy preparation capabilities at Rannis, and the use of systematic and structured evaluation.

A final, general challenge is to give higher priority to innovation. The Icelandic science and technology system has traditionally had a stronger focus on research than innovation, and the argument has been voiced in recent years that the country needs to develop a clear growth strategy based on innovation, most particularly voiced by the Taxell Commission in its set of nine recommendations under the heading «Focus on innovation».

Most of the aforementioned challenges have been met, at least in part. The document "*Iceland 2020 - governmental policy statement for the economy and community. knowledge, sustainability, welfare"* outlines a reform programme aimed at developing an efficient economy and society by 2020. Investments in education, human resources, innovation, and necessary infrastructures for the economy are key elements in the programme. A tax reduction for R&D performing companies is running. Tax incentives program was implemented in 2010
Target for national R&D has been set. The Investment Plan for Iceland 2103-2015 and the Government State Budget 2013 secure big increase in funding for the competitive funds. Centre´s of Excellence and Clusters (Strategic Research) programme was launched in 2009. There is focus on creative industries. Work has begun on Industrial policy for Iceland.

A new report called "A New vision - changes to the Innovation and science system" was published in December 2012 by the office of the Prime minister. In the report, written by working committee of the Icelandic Science and Technology policy council and Rannis, the science and innovation programs in Iceland are described and proposals on how they should be developed in the next few years. The Icelandic Science and Technology policy council has approved an action plan to implement the proposals put forward in the report.
The proposals for change centre on the following issues:

- Value creation - human capital - opportunities
- Measuring quality and results
- Financing innovation and science
- A simple and efficient science- and innovation system
- Access of the industry to skilled labour force

The progress will depend on how successfully these proposals will be put into action.

In many ways Iceland has been successful in dealing with the consequences of the crisis in 2008. Exports have been growing, there has been sharp reduction in emigration and unemployment has declined fast. The budget deficit is also greatly reduced.
There are still many economic problems and much will depend on how successfully Iceland and its leaders will be able to respond to these problems, high levels of debt, currency controls and lack of investments. Solutions are needed if private companies are to achieve the goal of increasing the level of investment in R&D and the same is true for the government if it is to increase the funding of universities, institutions and R&D.

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1 INTRODUCTION

Iceland is an island, 103.000km^{2,} with a population of 320.000 as of 1. January 2012. Around 2/3 of the population live in the capital area. The country is one NUTS 1 region, one NUTS 2 region and 2 NUTS 3 regions. The capital area is one NUTS 3 region and the rest of the country is one NUTS 3 area. The country is extremely sparsely populated with just over 3 inhabitants per km^2. This makes Iceland by far the most sparsely populated country in Europe. Iceland's population is only 0.0006% of the EU but Iceland is 1% of the land mass of EU.

Iceland was severely hit by the economic crisis in October 2008 when it's banking and financial system collapsed. Real GDP growth which was 6% in 2007, was -6.7% in 2009, -4% in 2010 but had turned positive in 2011 and was 2.6% compared to 1,5% in EU. It is estimated to have been positive again in 2012.
Inflation in 2012 was 6.0% compared to 2.6% in EU27 (Eurostat.). Inflation has been higher in Iceland than in the EU for many years.
As in the EU-27, GDP per capita in Iceland increased in 2010 and in 2011. Nominal GDP per capita in 2011 was €31.600 which is 26% higher than the EU-27 average. In PPS terms the gap to EU-27 was 12% (Eurostat)

The rate of currency fell quite drastically in the aftermath of the economic crisis. This had direct effect on the inflation and the price level. Export industries, especially the fishing industry gained form the devaluation of the krona which had direct impact on the economic recovery.

In 1994, Iceland became fully integrated into the European single market when it joined the European Economic Area Agreement (EEA), together with Norway and Lichtenstein. Iceland is also part of the group of European Free Trade Agreement (EFTA) states, together with Norway, Lichtenstein and Switzerland.

Through the EEA Agreement, Iceland has taken on a large part of the EUs single market legislation. In fact, 22 of the 35 chapters of all EU legislation have been incorporated into Icelandic legislation, and Iceland participates in various EU programmes, including the EU Framework Programmes for Research and Technology.

In July 2009 Iceland applied for accession to the European Union. The European Commission published its *Opinion on Iceland's application for membership of the European Union* in February 2010 and recommended that negotiations for accession should be opened. Negotiations were formally opened in July 2010. There have so far been five Accession Conference meetings, and a total of 27 chapters have been opened up for negotiation. 11 of the 27 chapters have been provisionally closed.

Gross *expenditure* on R&D amounted to €269m in 2009. The business enterprise sector financed 48.7% (€130m) of the total and the government sector 40.4% (€111m). 10.3% (€27m) was funded from abroad and the rest 0.5% by private non- profit (Rannis).

The business enterprise sector was the main *performer* of R&D in 2009. The sector performed R8D amounting to €142m that year. The figures for the higher education sector and government sectors were €67m and €54m respectively. (Rannis)

In total 5.500 persons performed R&D in Iceland in 2009, accounting for approximately four thousand full time equivalents (FTE). Most of the FTE´s (42%) were performed within the private sector. 76% of the FTE´s were performed by researchers and men performed 61% of the R&D. (Rannis)

According to *Innovation Union Scoreboard 2011*, new doctorate graduates, per 1000 population aged 25-34, were 0.7 in Iceland while the EU27 average was 1.5. The growth in number of doctorate graduates in Iceland was 23.6% while in the EU27 it was 6.9%. International scientific co-publications were 1557 per million populations while in the EU27 they were 301. PCT patent applications in Iceland per billion GDP were 2.67 while in the EU27 they were 3.78.

It is essential to notice that around half of doctoral degrees are earned abroad[3]. The IUS Scoreboard does only take into consideration the domestic doctoral degrees. On the other hand in 2011 49% of doctoral degrees were earned abroad. The IUS is only considering half of the degrees in its analysis.

According to the Innovation Union Scoreboard 2011, Iceland is *innovation follower*. Relative strengths are in Open, excellent and attractive research systems, Finance and support, Firm investments and Linkages & entrepreneurship. Relative weaknesses are in Human resources and intellectual assets. High growth is observed for New doctorate students and Community trademarks. A strong decline for patent application is observed. Growth performance in Human resources, Open, excellent and attractive research systems and Firm investments is well above average.

The Ministry for Education, Science and Culture is the key ministry in charge of implementing R&D policy in Iceland, but several other ministries also have a role to play, due to their responsibilities for research organisations in their own fields.
The Science and Technology Policy Council (STPC) is the key strategic body at the core of the R&D policy system in Iceland. It includes 22 members and is headed by the prime minister. The role of this body is to define the strategic orientations for the science and technology policy in Iceland. Its objective is to strengthen scientific research and graduate education in Iceland by supporting basic research.

On the operational level, the *Icelandic Centre for Research (Rannis),* has been entrusted with an important role of preparation and implementation of STI policy and dissemination of information to society. Rannis reports to the Ministry of Education, Science and Culture, and serves the Icelandic science and technology community as a whole. It provides technical support to STPC and the Council's committees as well as to funding bodies, and manages and follows up implementation of most research programmes.

Research policy is primarily a national policy in Iceland. There are no regional research programmes in Iceland.

There are *seven nationally accredited higher education institutions* in Iceland. The leading public HEI, the University of Iceland, is the only university offering a complete range of disciplines. It is also the most substantial public R&D performer.

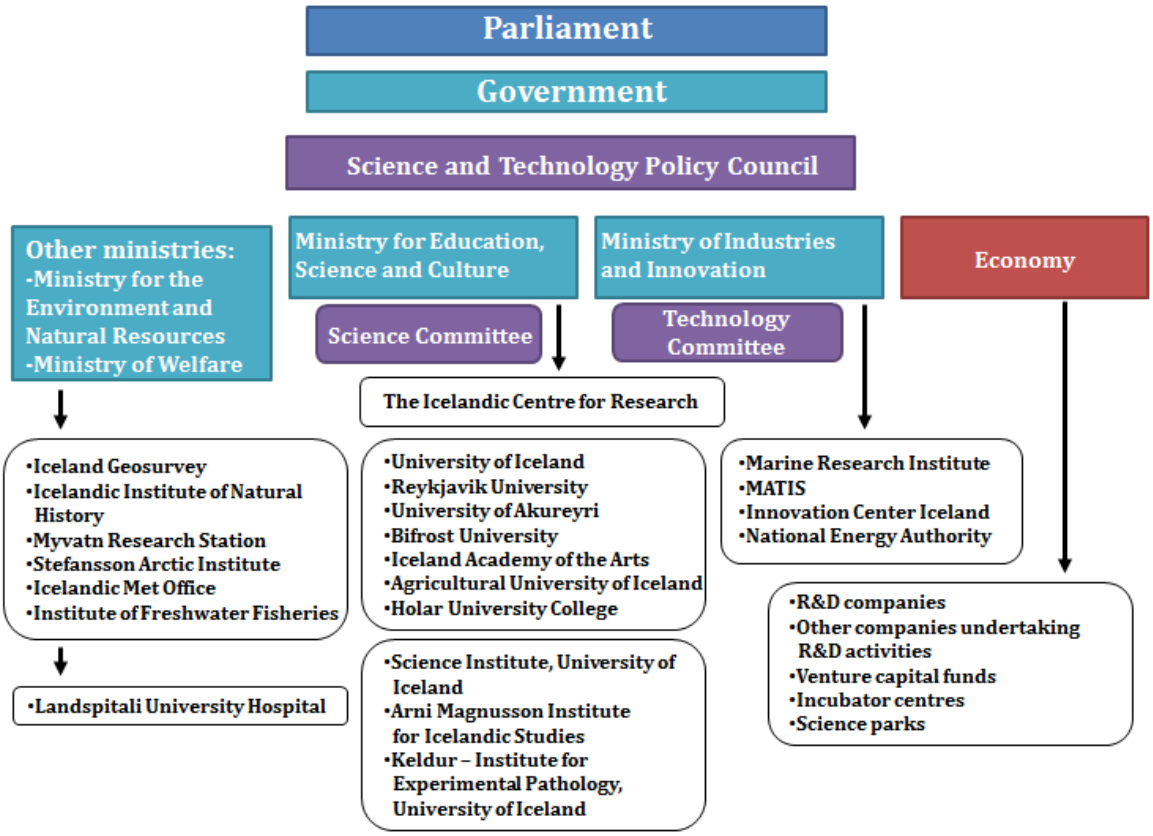
Five companies, Actavis, CCP, Decode Genetics, Marel and Össur have been the largest contributors to private research and development or about 70% of total spending in 2009.[4]

[3] The source of this is the NIFU database on Nordic and Baltic doctoral degrees with data from 1990. "http://www.foustatistikkbanken.no/nifu/" (Rannis)
[4] NEW VISION (page 41), Forsætisráðuneytið

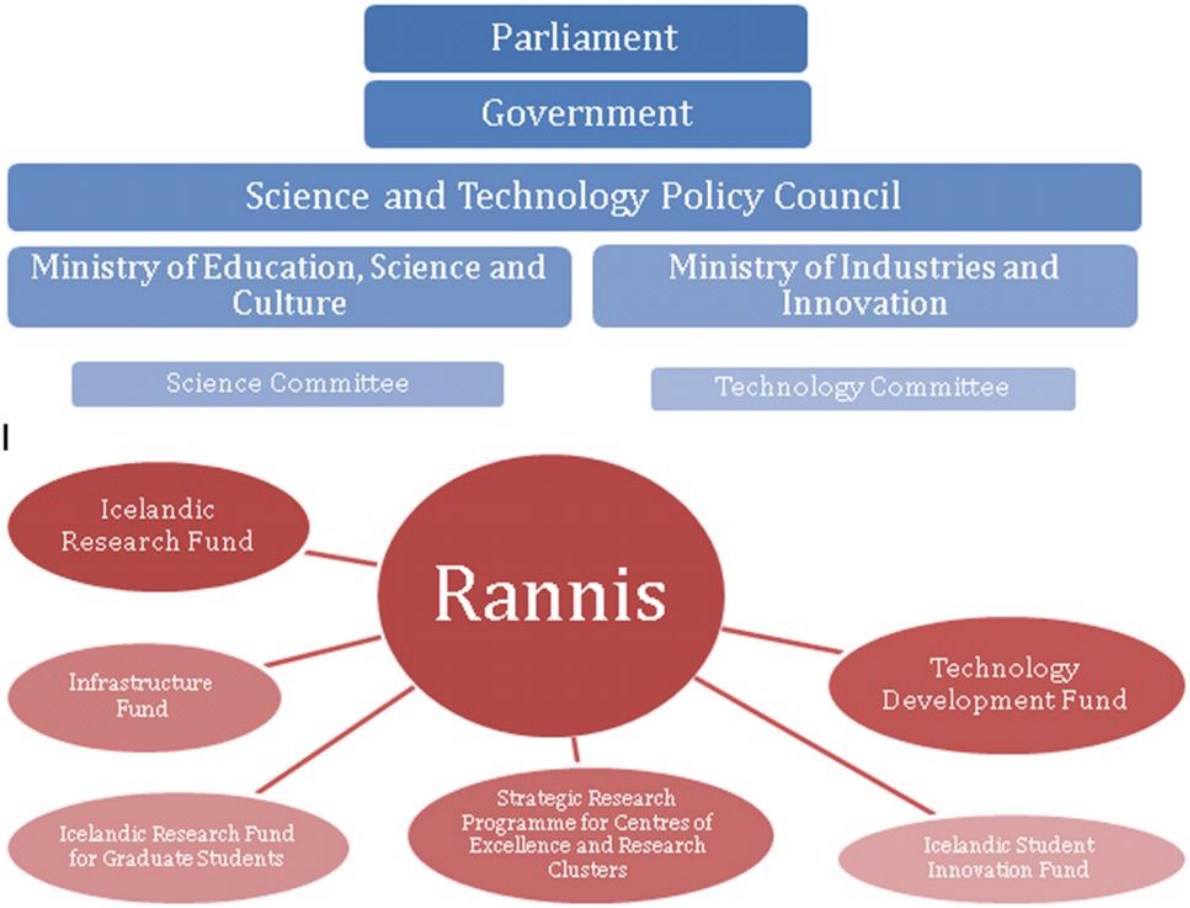
The *fishing industry* is a sector that has achieved both high labour and capital productivity. Productivity of Icelandic industry is low compared to countries Iceland compares to, with exception of the fishing industry. The structure and composition of the industry does not explain this lack of productivity. The *power industry* has provided the foundation for a strong export-based heavy industry sector. *Tourism* has grown substantially in the last few years.
Geothermal science, health and life sciences as well as *creative industries/ICT* have particular growth potential in Iceland.

The figures below depict the main actors and institutions as well as funding flow within the Icelandic research system.

Iceland´s research and innovation system governance structure
from 1. September 2012:



Organization of Icelandic competitive research funds under the auspices of the Science and Technology Policy Council



2 RECENT DEVELOPMENTS OF THE RESEARCH AND INNOVATION POLICY AND SYSTEM

2.1 NATIONAL ECONOMIC AND POLITICAL CONTEXT

Iceland was severely affected by the global financial crisis and experienced a complete collapse of the banking and financial sector in October 2008. The currency, the Icelandic krona also collapsed in 2008. Foreign exchange transactions have been subject to capital controls ever since the banking system collapsed in the autumn of 2008. In the end of 2007 the Icelandic krona was 91.18 against the €. At the end of 2012 the rate was 169.92 against the €.
After having contracted by 6.5% in 2009 and 3.6% in 2010 the GDP grew by 2.2% in 2011.
The trade balance has been positive since 2009 and the financial crisis did not result in a drop in exports. Fish and other marine products have been the mainstay of goods exports, although they have been declining as a share of total exports in recent decades. In 2011, fish and other marine products accounted for 41% of goods exports and 26% of total exports, down from 75% and 56%, respectively, in 1990. Exports of manufactured goods have been growing rapidly in importance, led by aluminium smelting and medical and pharmaceutical products, and accounted for 54% of goods exports in 2011 (up from 30% in 2000) and 35% of total exports. Exports of services have also soared as the economy has grown and become increasingly service-oriented. Tourism has increased substantially over the past few years and is becoming one of the main engines of export growth. Services now account for almost 35% of total export revenues, up from 26% in 1990.[5]

The primary balance of the government budget was in a deficit of 68.9 billion ISK in 2009 but had become positive in 2011 to the amount of 9.2 billion ISK.

Inflation is higher than in EU and interest rates are high.

Unemployment was 3.0% in 2008, rose to 7.6% in 2010 but has fallen since and was 5.7% in December 2012.

[5] http://www.cb.is/publications-and-speeches/publications/economy-of-iceland/ page 15.

2.2 FUNDING TRENDS

	2009	2010	2011	2012 (estimate, if such data are available)	2020 national target	EU average 2011
GDP growth rate	-6.6	-4.0	2.6	2,7	2,8	1.5
GERD as % of GDP	3,1				4,0	2.03
GBAORD (€ million)	95,4	100,2	94,4	101,1		87.507
GBAORD as % of GDP	1.1	1.06	0.94	0.93		0.69
BERD (€ million)	148.599	142.463				159.975.937
BERD as % of GDP	1.64	1.44				1.25
R&D performed by HEIs (% of GERD)	24.9					
R&D performed by PROs (% of GERD)	20.0					
R&D performed by Business Enterprise sector	52.9					
Rate of exchange €	172	161,9	161,4	160,7		

The policy of the government has been to increase funding for research and development as a part of the planned response to deal with the effects to the financial crisis but the state of government finances was such that funding for research and development has gone down between 2010 and 2011. Public funding for research and development through the competitive programs has decreased by almost 15% between the years 2008 and 2011. And according to STPC public funding for universities, institutes and funds has decreased by 4.ooom ISK, (fixed prices) or more than 20%, between the years 2008 and 2012.

Composition of funding for research and development has been little changed between the years 2007 and 2009. As a share of the total funding the government has gone up by 3% while the corporations have gone down by 2%. Foreign funding has been little changed while private non-profits have gone down by 1%. Close to 80% of public funding for research and development is tied to appropriations for institutions but 20% is competitive funding. These ratios have been quite stable for the last few years.

2.3 NEW POLICY MEASURES

In May 2012 the Government introduced an Investment Plan for Iceland for the years 2013-2015. The objective of the Investment Plan is to strengthen economic growth and diversity in the economy. This strategy is a part of the recovery plan launched in the wake of the economic collapse and is designed to support the economic recovery. The objectives of the recovery plan (Economic Stabilisation Program) made with the International Monetary Fund were as follows:

1. Restore confidence in the Icelandic economy and stabilise the Icelandic krona through a comprehensive and strong macro-economic program;

2. Restore fiscal sustainability and prepare a strong medium-term fiscal consolidation program;

3. Implement a sound banking strategy to re-establish a viable banking system to support the Icelandic economy.

The preparation of this investment plan and priority tasks was based on the Government's existing fiscal and economic policies and the Iceland 2020 Policy Statement.

2.4 RECENT POLICY DOCUMENTS

The investment plan for Iceland 2013-2015[6] was approved with the passage of the government budget for 2013 in December 2012. In the budget an increase of 550m ISK was approved for the Research Fund, an increase of 550 of the Technology Development Fund and for the Strategic Programs there was an increase of 200m ISK. As these funds invite applications and do their allocations on a competitive basis the percentage of funds allocated in this way will increase from around 15% to close to 20% of governmental contribution to R&D (Rannis 19.03.13).
Annual contribution of ISK 1,200 m. will be made for the development of employment and regional plans of action.

In the end of 2012 an amendment was approved to the "Act on Public Support for Scientific Research No. 3/2003. The change is not big and takes effect in 2013.

1. The Research Fund and The Icelandic Research Fund for Graduate Students have been merged) under the name of The Research Fund.
2. The name of the Equipment Fund has been changed to the Infrastructure fund its role expanded accordingly.
3. The Strategic Program has now been given a legal basis and a Board appointed.
4. Open access: Research findings, funded through the funds governed by these laws shall be available in open access unless other exception's have been agreed upon.

2.5 RESEARCH AND INNOVATION SYSTEM CHANGES

Since 2009 the number of Ministries in Iceland has decreased from 12 to 8. Most important in this respect is that the Ministry of Industry, Energy and Tourism and the Ministry of Fisheries and Agriculture have been merged in the Ministry of Industries and Innovation. This change in the structure of the ministries has led to a change in the structure of the science and research system
These changes simplify the public sector as all industries are now covered in the same ministry. This will (in turn) make the coordination of all government research funds easier, more targeted and effective.

2.6 REGIONAL AND/OR NATIONAL RESEARCH AND INNOVATION STRATEGIES ON SMART SPECIALISATION (RIS3)

Regional or National Research and Innovation Strategies on Smart Specialisation (RIS3) has not been implemented in Iceland but is under consideration.

6 http://eng.forsaetisraduneyti.is/news-and-articles/nr/7180

2.7 EVALUATIONS, CONSULTATIONS

A report called "NÝ SÝN - Breytingar á vísinda- og nýsköpunarkerfinu" (NEW VISION - changes to the Innovation and science system)[7] was published in December 2012 by the office of the Prime minister. The report, written by working committee of the Icelandic Science and Technology policy council, describes the science and innovation programs in Iceland and proposes how they should be developed in the next few years. An open consultation process was utilised in the writing of the report. The Icelandic Science and Technology policy council has approved an action plan to implement the proposals put forward in the report.
The proposals for change centre on the following issues:

- Value creation - human capital - opportunities
- Measuring quality and results
- Financing innovation and science
- A simple and efficient science- and innovation system

The report has not been translated into English and is at the time of writing not available online in English.

The definition of performance indicators for research has been included in the University of Iceland's Strategic Plan, in negotiation with the Ministry of Education, Science and Culture. Annual reports on values reached by these indicators are provided by the University to the Ministry, and are subject to follow-up. Similar agreements have been made with the other universities for a five years period (2012-2016). Performance of all the universities will be assessed over the period. Evaluation on the progress of the Strategic programmes was concluded late in 2012.

The Quality Board for Icelandic higher education was established in 2010 by the Ministry of Education, Science and Culture tasked with taking forward the development of a Quality Enhancement Framework (QEF) for the higher education sector in Iceland. The QEF secretariat is provided by Rannis. The secretariat provides a single point of entry for all enquiries related to the QEF. It provides support for all meetings and events sponsored by the Board. In addition it drafts background papers and reports as required in support of the effective operation of the Council. One of the elements within the Quality Enhancement Framework for Icelandic higher education is the Quality Board-led reviews at the institutional level. The first cycle of these reviews spans the period 2011-2016. Reviews will be carried out during the first four of these years with the final year of the cycle (2015-2016) being a year of reflection and preparations for the following period. As a part of this framework a report on the performance of the University of Reykjavík was finished in September 2012.

As a part of participation in a European project (CIA4OPM) Rannis conducted an impact assessment of the Technology Development Fund in 2010. The results of the impact assessment of the Technology Development Fund indicate that the fund has considerable impact in providing important support as the main foundation for innovation at national level. The fund's beneficiaries generally agree that it provides important benefit for various fields of research and development, emphasizing that the support provided by the fund generates tangible value in the form of products and services, as well as increased knowledge, education and experience.

[7] http://rannis.is/frettir/2013/01/ny-syn,-breytingar-a-visinda-og-nyskoepunarkerfinu/

In 2011 the ministry of education and culture contracted a study of evaluation of Icelandic participation in the 7th Framework programme in the period 2003 to 2011. The results indicated that this participation has coursed large changes in the R&D in Iceland. The impact is mostly visible in the areas were Iceland is already in strong position.

3 STRUCTURAL CHALLENGES FACED BY THE NATIONAL SYSTEM

Iceland has a fully-fledged research and innovation system. Total investments in R&D are relatively high, and the share of Human Resources in Science and Technology (HRTS) has increased over the years to above the EU-27 average.

The Innovation Union Competitiveness Report 2011 describes Iceland as a very knowledge intensive economy with a strong public research system, excellent research quality and high researcher intensity in the labour force. The report then points out that it will be a challenge to maintain this strength because of low level of new doctoral graduates per thousand populations. This is changing for the better as is pointed out just below. It should be emphasised that the benchmarking does not take into account the new doctorate degrees earned by Icelanders in other countries. These degrees are of same quality as those of the national ones. This situation is specific for Iceland compared to other European nations.

According to the Innovation Union Scoreboard 2011, Iceland has a below average innovation performance and the country is categorised as an innovation follower.

Relative strengths are observed in the scoreboard categories:

- Open excellent and attractive research systems
- Finance and support
- Firm investment and
- Linkages & entrepreneurship

Relative weaknesses are observed in the scoreboard categories:

- Human resources and
- Intellectual assets.

Indicators where Iceland scores well below the EU-27 average include:

- community designs
- knowledge-intensive services exports
- new doctorate graduates and
- PCT patent applications.

Still, the indicator on 'community trademarks' show high annual average growth, while 'PCT patent applications' and 'knowledge-intensive services exports' on the other hand show a strong decline. The index of 'new doctorate students' shows high growth. However, this concerns domestic PhD candidates, and does not include PhD candidates educated abroad. About 50% of Icelandic PhD candidates have their PhD degree outside of Iceland. The number of PhD students increased from 283 in 2008 to 510 in 2011, students abroad included (Rannis).

The structural challenges identified as facing the Icelandic research and innovation system:

- low share of private R&D investments;
- low levels of competitive research funding;
- insufficient research prioritisation;
- weaknesses in governance; and
- focus on research rather than innovation.

Low share of private R&D investments. A significant share of total R&D investments in Iceland comes from the public sector. In 2009, the public sector accounted for 40.4% of total investments. The business sector accounted for 48.7%, which represented a decline from 2007

when the share was 50.3%. According to the Innovation Union Competitiveness Report 2011, the average annual growth in business enterprise expenditure on R&D in Iceland is lower than in the EU on average, and this is seen as a key weakness in the Icelandic innovation and research system.[8]

The government-appointed international expert panel led by Christoffer Taxell stated in its report in 2009, that «only a few companies … account for a large share of industry related research and development. This makes the entire industrial research and development landscape vulnerable [Thus] the population of research and development active/intensive companies needs to be broadened». This concern over the relatively low share of private R&D funding in Iceland has been expressed in previous ERAWATCH country reports. The country has few R&D active domestic firms, and government funding for private R&D performers is limited. (ERAWATCH country reports for Iceland for 2009, 2010 and 2011). The Taxell Commission panel believed that present policy measures aimed towards stimulating R&D were insufficient or ineffective, and saw it as a challenge to broaden the share of R&D-active companies, and particularly high-tech companies. (Taxell et al, 2009)

Low levels of competitive research funding. Another challenge identified by the international expert panel, was the low level of competitive research funding. The panel argued that the level of competitive funding (14% at the time) was too low for efficient management of science and research and that increasing the level at the cost of block funding would also benefit research quality. (Taxell et al, 2009)

The challenge of increasing competitive funding is not new, as the ERAWATCH country report for 2009 points out. It was a key issue when the STPC was established in 2003, and remained valid when the economic crisis set in after the banking collapse in 2008. The report stresses that it is not only a matter of increasing the share of competitive funding at the cost of block funding, but also an extension of performance-based criteria for block funding. According to the 2010 ERAWATCH country report, actual and expected cuts in public R&D funding due to the crisis mean that the level of competitive funding in Iceland will continue to pose a challenge.

Things are moving in the right direction. Competitive funding grew to 17% in 2009 and it is projected that funding will increase considerably from 2013, or by 1.3 billion ISK according to the government budget for 2013 and then by 2 billion a year according to the Investment Plan for Iceland 2013 - 2015

Insufficient research prioritisation. The strong position of block funding in Iceland contributes to the fact that setting of thematic priorities in public R&D funding is difficult. This point is made in the report of the aforementioned international expert panel. It is stated that Iceland seems to lack sufficient instruments for research prioritisation, and that this has a negative influence on research in general (Taxell et al, 2009). The lack of prioritisation in research policy is also identified as a weakness in the most recent ERAWATCH country reports (ERAWATCH country reports for Iceland for 2009, 2010 and 2011).

Weaknesses in governance. Governance constitutes a weakness in Icelandic research and innovation policies. On the one hand, the design and coordination of R&D policies is linked to the highest political level. The key strategic body, STPC, is headed by the prime minister and involves all ministries with responsibilities within the science, technology and innovation domain. On the other hand, expert assessments of the Icelandic innovation system have identified a number of weaknesses related to governance. They include weak policy making abilities in STPC; weak policy preparation capabilities at Rannis, and lack of systematic evaluation practices. This could imply that the country might be better served by more focused

[8] According to the Innovation Union Scoreboard 2011, Annex B, Growth performance, R&D expenditure in the business sector grew by 0.8% in Iceland while it grew at 1.3% in the EU27.

and strategic research expenditure based on its current levels, rather than simply increasing its expenditure – sometimes the decision to spend more is easier than the decision to spend wisely. Other weaknesses in terms of governance include:

- diversity in the higher education and research system
- lack of systematic evaluation, especially with regards to R&D programmes

Focus on research rather than innovation. A final, general challenge is to give *higher priority to innovation*. The Icelandic innovation system has traditionally had a stronger focus on research than innovation, and the argument has been voiced in recent years that the country needs to develop a clear growth strategy based on innovation (TrendChart mini country report Iceland, 2011). The Taxell expert panel believed that the economic crisis should be viewed as "an opportunity to ramp up innovation levels" and one of the main recommendations of the panel was "that the new Icelandic government makes innovation a key strategic priority." (Taxell et al, 2009).

The new report "NEW VISION" by STPC states that the institutional and support system is in many ways designed with the needs of the traditional industries in mind. The mechanism for the funding of science and innovation is rigid and 80% of the total funds is tied to funding of institutions and only 20% through completive funding. Also that comparatively high level of funding goes to research and development.

HUMAN RESOURCES	
New doctorate graduates (ISCED 6) per 1000 population aged 25-34 (national degrees only)	0.7
Percentage population aged 25-64 having completed tertiary education	40,9
Open, excellent and attractive research systems	
International scientific co-publications per million population	1557
Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country	11.87
1Finance and support	
R&D expenditure in the public sector as % of GDP	1,1
FIRM ACTIVITIES	
R&D expenditure in the business sector as % of GDP	1.64
Linkages & entrepreneurship	
Public-private co-publications per million population	126.2
Intellectual assets	
PCT patents applications per billion GDP (in PPS€)	2.67
PCT patents applications in societal challenges per billion GDP (in PPS€) (climate change mitigation; health)	0.52
OUTPUTS	
Economic effects	
Medium and high-tech product exports as % total product exports	16,7
Knowledge-intensive services exports as % total service exports	53,00
License and patent revenues from abroad as % of GDP	1,17

4 ASSESSMENT OF THE NATIONAL INNOVATION STRATEGY

4.1 NATIONAL RESEARCH AND INNOVATION PRIORITIES

On the policy design level, the Science and Technology Policy Council (STPC) is the key strategic body in Iceland. The role of the Council is to define the strategic orientations for science and technology policy in Iceland.

Since its establishment in 2003, STPC has devised multiannual strategies for research and innovation. A new strategy for the years 2013 - 2015 is being worked on and it is expected to be completed in the spring of 2013.

The strategy, entitled *Building on Solid Foundations. Science and Technology Policy for Iceland 2010-2012* highlighted the following priorities:

- focus on innovation and close industry support, and user-driven innovation;
- a strong focus on the role of creative industries in national innovation performance,
- more cooperation and synergy among the various universities, research institutions and other actors in the system;
- evaluation and quality control;
- international cooperation and participation in international programmes; and
- funding on the basis of excellence and thus competition.

Several of the priorities were in line with the challenges identified in various expert reports. Mention should in this context be made of the national task force appointed in 2009 by the Ministry of Education, Science and Culture with the mandate to analyse the future challenges of Iceland's education, research and innovation policy. The work of the national task force was complemented by the work of the aforementioned international expert panel led by Christoffer Taxell. The main recommendations of the Taxell expert panel dealt with the importance of continuous investments in education at all levels; the reshaping of the education and research landscape in order to create and stimulate higher levels of synergies; the need to increase the focus on innovation; and the need to reform the research and innovation governance structures and systems (see TrendChart mini country report Iceland. 2011). The mission statement of the STPC strategy, «Tækifæri til markvissrar sóknar» - translated as going forward with clear objectives was clearly an answer to the Taxell report's call for intelligent prioritisation.

The STPC strategy emphasised the need for specific actions to encourage private sector R&D investments. The introduction of a tax deduction scheme for industrial R&D in 2010 is a recent example of a development in the Icelandic policy mix aimed at fostering private R&D investments.

At the same time, there has been a trend towards more thematic prioritisation. This is reflected in the current focus on the creative industries, geothermal energy and sciences, as well as the establishment of the Strategic Research Programme in 2009, aimed at fostering outstanding collaborative research.

A recurrent criticism of the Icelandic research funding system has been that insufficient public research and innovation allocations are made through competitive funds. This was a key point in the Taxell report. The Taxell Commission said that «the [present] level of competitive funding is

too low … 86% block funding needs to be redistributed [within a competitive funding scheme] ». They also argued that the size of individual grants is generally too small.
This challenge is further reinforced by budgetary practice and rules in the setting up of annual state budgets. The major expenditure type in both types of funding, block and competitive grants, is salaries. However, from a state budgetary perspective they are treated differently. While block grants are seen as providing a framework for intermediate public consumption, there is a tendency to see competitive funding schemes as ordinary transfer payments. Hence, while block grants to institutions are more or less automatically adjusted for wage increases and inflation in the budgetary process, the allocations to competitive funding schemes are not. This, of course, tends to aggravate the already low ratio of competitive to non-competitive funding.

Iceland 2020 Strategy

In January 2011 the Icelandic policy response to the Europe 2020 strategy, «Iceland 2020 – Knowledge, sustainability, welfare», was published, under the auspices of the Prime Minister's Office9, see also the conclusion report of the Iceland 2020 Moving Iceland Forward Initiative10. The development of the Iceland 2020 reform program was integrated with the recovery program of the Icelandic economy, government and society, following the financial crisis and the ensuing political crisis
The 2020 program sets up 20 objectives to be achieved within 2020. 15 of these are characterized as «measurable» targets, as milestones. Of particular relevance to this report are the following targets11:

- That 4% of the GDP shall be allocated to research, development and innovation[12] by 2020. The investment by the private sector shall be 70% against a 30% contribution from the public sector through contributions to competitive funds and research programs.
- Latest available data are from 2009, when the index was at 3.1%. The share of private funding was at 49%, with public funding at 40%.
- That by 2020, Iceland be in the top 10 nations on the E-government development index and E-participation Index measured by the United Nations.
- From being no. 14 in 2004, Iceland fell, being no 22 on the UN E-government index in 2010. On the UN E-participation index, Iceland was at 135th place in 2010.
- That by 2020, the high-tech industry will account for 10% of the GDP and 15% of the value of exports. Present data is not give.

The setting of a quantitative target for R&D spending is a new development in Icelandic research and innovation policies. Until recently the country did not have any quantitative target

9 http://www.forsaetisraduneyti.is/media/Skyrslur/island2020.pdf, Accessed: 25 March 2012
An English translation of the policy statement is available at
http://eng.forsaetisraduneyti.is/media/2020/iceland2020.pdf, Accessed: 25 March 2012
10 For an English translations, see
http://www.forsaetisraduneyti.is/media/2020/2020Moving-Iceland-Forward-Initiative.pdf, Accessed: 25 March 2012
11 Present values of the milestones are given at http://www.forsaetisraduneyti.is/2020/maelikvardar/
12 Both the Icelandic policy statement and the English translation, states explicitly that the target is for R&D&I, «rannsókna, þróunar og nýsköpunar», resp. «research, development and innovation». However, the list of milestones, http://www.forsaetisraduneyti.is/2020/maelikvardar/, reproduces the standard GERD/GDP indicator.

along the lines of the Barcelona 3% of GDP target. But the strategy document *Iceland 2020*, includes a quantitative target for R&D&I spending. According to the plan, 4% of GDP should go to R&D&I by 2020. It is unclear, however, to what extent this target is evidenced-based, or founded on a consensus among stakeholders and the public.

Furthermore the Iceland 2020 strategy suggests two consolidating initiatives; merging of universities and the integration of research and industrial funds under Rannis.

4.2 EVOLUTION AND ANALYSIS OF THE POLICY MIXES

A succinct overview of the evolution of the innovation policy mix in Iceland is given in the TrendChart mini country report for 2011. According to the report, the policy mix has remained rather stable over time. In general focus has been on:

- research instead of innovation
- knowledge generation rather than knowledge diffusion and application
- general, horizontal support rather than thematic focus and prioritisation
- technological rather than non-technological support (e.g. services, business model innovation, social innovation, etc.) and
- direct rather than indirect types of support

Since the economic crisis, however, a number of changes have been observed. First of all, the 2011 TrendChart Report points out substantially reduced budgets for R&D and innovation.

At the same time, there has been a small trend towards more thematic prioritisation. This is reflected in the current focus on the creative industries and geothermal energy and sciences, as well as the establishment of the Strategic Research Programme in 2009. Three Strategic Research Programmes were established in 2009 all of which are planned for a seven year period: The Icelandic Institute for Intelligent machines; The Geothermal Research Group; and The Centre of Excellence in Gender, Equality and Diversity Research. However, in terms of public R&D funding, these initiatives affect a rather small share.

The report moreover sees a stronger focus on innovation and non-technological support, mainly through Innovation Centre Iceland (ICI). ICI and particularly the subunit Impra – Service Centre for Entrepreneurs and SME's, has intensified support in the areas of research commercialisation, entrepreneurship, design and creativity, and social innovation. A recent ICI initiative that receives special attention is the Iceland Living Lab (LL). This is an initiative aimed at establishing user-producer relationships and promoting collaboration in the development of goods and services.

Mention is also given of an assessment Rannis has made of the impact of the Technology Development Fund. The assessment showed that the fund plays an important role in promoting industrial innovation and the creation of valuable knowledge.

Another development highlighted in the report is that both the government and STPC now recognise the low Icelandic levels of competitive funding as a problem and view the introduction of competitive elements in R&D funding as an opportunity to improve quality and excellence. While STPC addressed the issue in its science and innovation strategy and recommended "increasing the proportion of public funding to research and innovation through competitive funding", the economic crisis and the resulting budget cuts have made it difficult to meet this recommendation. The ERAWATCH country report for 2010 pointed out that, even though the policy for the budget cuts has been to maintain the competitive funding element as far as possible, cuts in competitive funds were made in the 2011 budget.

Based on the Innovation Union self-assessment tool, the strong political focus on promoting research and innovation in Iceland can be identified as a major strength.

The role of research and innovation has increased in importance on the general government agenda over the past decade, and in the wake of the economic crisis, R&D and innovation have been defined as key elements in the process towards recovery and new growth. According to the TrendChart mini country report for 2011, the focus on other major societal challenges has become less explicit after the crisis, but lifelong learning and the development of adequate skills for the future are mentioned as areas that receive political attention.

The strong political commitment to research and innovation in Iceland is evident from fact that in an economic situation that calls for cuts in public spending, the government emphasises that it will prioritise allocation of funding to R&D and innovation. The total annual R&D investments of the country are relatively high: they amounted to 3.1% of GDP in 2009, and a significant share – 40.4% - came from the public sector. From 2008 to 2012, however, cuts to universities, institutes and public R&D budgets have been around 20% or 4billion ISK, and the economic crisis clearly makes it challenging to maintain sufficient public funding for research and innovation (STCP report NEW VISION).

Mobilising private R&D funding in times of economic crisis is another challenge (TrendChart mini country report 2011). The level of private R&D funding in Iceland is generally believed to be too low: in 2009, the business sector accounted for 48.7% of total annual R&D investments, which represented a decline from 50.4% in 2008. Against this background, it emerges as a major weakness that private R&D performers receive limited government support. The policy measures aimed towards stimulating business R&D in Iceland are characterised by the aforementioned expert panel led by Taxell as insufficient or ineffective (Taxell et al, 2009).

The STPC strategy 2010 -2012 emphasised the need to increase private sector investments and a recent initiative to stimulate companies to invest in R&D is a tax reduction scheme that was introduced in 2010 which allows companies tax deductions for up to 20% of costs incurred in R&D projects (within the limit of annual project costs of €625,000 per company). If the company is in a tax position, the 20% refunding is done through the income tax system by lowering the taxes. If the company accounts run with a loss and are not levied with income tax for the accounting year, the 20% of R&D costs are refunded directly to the company. Tax deductions for 2011 were 680m ISK and for 2012 they were 876m ISK. The two years that the law has been in effect there have been 250 projects from 140 legal entities approved as research and innovation projects. With these measures it is anticipated that funds from the private sector towards research and development will increase considerably.[13]

That the Icelandic government has ambitious goals for national R&D investments - and not least for private sector investments - is evident from the aforementioned target that 4% of GDP should go to R&D&I by 2020 with companies' contributing 70% of the total. It is, however, as already pointed out, unclear whether this new target is justified by an evidence base or public consensus. Moreover, it implies raising R&D expenditure by almost a further 25%, and given the current economic climate, there is reason to question how realistic the target is.

There is evidence of some improvement in the area of governance. The TrendChart mini country report 2011 argues that the current strategy of STPC contains stronger statements than previous versions, and this is seen as "a welcome development that reflects the empowerment of the Council as a policy setting body." The strategy also place emphasis on evaluation, but the TrendChart report maintains that evaluation capabilities are still limited and that Iceland lacks a genuine evaluation culture. Strengthening evaluation practices is a critical point in relation to the point made above about spending more wisely rather than simply spending more.

[13] „http://rannis.is/media/72153/Ný%20sýn%20vef.pdf"

Stimulating innovation through public procurement is also an opportunity that receives political attention in Iceland. According to the TrendChart mini country report for 2011, the country is witnessing «increasing awareness of the importance and potential power of the government as purchaser of innovative solutions." The report stresses that while there are concrete initiatives in the area of innovative procurement and even a legal framework, the country still has a way to go. It argues that "the major challenge and step forward at the same time, would [be] that government official (sic) take up the commitment and formulate an effective public procurement policy that centres on innovation». In 2011 the Technology Development Fund received additional money to initiate an experimental project on public procurement within the energy/environment, health and education sectors. The initiative, «More value for less money» is a venture of Rannis in collaboration with the Confederation of Icelandic Industries, together with many stakeholders. Following a call for projects, funds were allocated to 10 projects at the end of the year. The continuing operation of this project is not yet determined, according to Rannis.

4.3 ASSESSMENT OF THE POLICY MIX

The weaknesses of the Icelandic policy mix that emerge from the analysis based on the Innovation Union self-assessment tool are to a large extent in accordance with the structural challenges that are identified in Chapter 3. The challenges are:

- low share of private R&D investments;
- low levels of competitive research funding;
- insufficient research prioritisation;
- weaknesses in governance; and
- focus on research rather than innovation.

This section assesses the extent to which the current policy mix is able to meet these structural challenges (and the priorities outlined in chapter 4.1).

The STPC strategy and the Iceland 2020 initiative, address all these five challenges.

Low share of private R&D investments. It has already been pointed out that the STCP strategy 2010 - 2012 placed emphasis on increasing private sector investments and that a tax reduction scheme for industrial R&D was introduced in 2010. This shows that there are policy developments addressing the challenge of low levels of private R&D funding.

Tax deductions for 2011 were 680m ISK and for 2012 they were 876m ISK. The two years that the law has been in effect there have been 250 projects from 140 legal entities approved as research and innovation projects. With these measures it is anticipated that funds from the private sector towards research and development will increase considerably.

Low levels of competitive research funding. The low level of competitive research funding in Iceland has become an explicit political concern. The STPC strategy recommended that the proportion of public funding to research and innovation through competitive funding should be increased, and in a situation where budget cuts have to be made, the policy has been to maintain the competitive funding element as far as possible. Cuts in competitive funds were nevertheless made in the 2011 budget, and to increase the level of competitive funding is a challenging task given the current circumstances.

The STPC strategy and the Iceland 2020 initiative set up new targets, as already mentioned, for facing the first three challenges, for increasing the private share of R&D investments, increasing the level of competitive funding, and outline several priorities.

By introducing the Investment Plan for Iceland 2013-2015 where a considerable increase to the Research Fund, Technology Development Fund and Strategic Research Programme has been proposed and the increase in the approved budget for 2013 with an increase of 1.3 billion ISK, the total allocations for competitive funds will have been increased considerably. This is in line with the emphasis that the government and the STPC have put on the necessity to increase the share of competitive funds in the financing of research and innovation.

Insufficient research prioritisation. As pointed out earlier, there has been an observable trend in the evolution of the Icelandic policy mix toward somewhat stronger thematic research priorities. The establishment of the Strategic Research Programme in 2009 and the current focus on the creative industries, geothermal energy and sciences, are cases in point. As noted above, the size of these prioritized funds is as of today fairly small, compared to total government R&D funding.

Weaknesses in governance. According to the TrendChart mini country report for 2011, there is evidence of some improvement in the area of innovation governance. The operations of STPC have been strengthened, e.g. through more frequent meetings, and the strategy 2010 – 2012 indicates that the Council has become a more powerful policy setting body

This would complement a consolidation of both research and industrial funds under Rannis, together with the effect of an increased level of competitive funding on Rannis and its role in Icelandic R&D&I policy development and implementation.

Knowledge application and innovation have gained a stronger position in the Icelandic policy mix in recent years. New and intensified support efforts in the areas of research commercialisation, entrepreneurship, design and creativity, and social innovation are offered by ICI, and particularly Impra. An assessment of the impact of the Technology Development Fund has moreover shown that the fund plays an important role in promoting industrial innovation. Further efforts are needed, however: giving priority to innovation and developing a clear growth strategy based on innovation are identified as key challenges for Icelandic policymakers in the TrendChart mini country report for 2011.

It is a positive sign that the strategy stresses the importance of evaluation. Still, as the TrendChart report underlines, Iceland has no real evaluation culture yet and evaluation capabilities remain limited.

In the report "NEW VISION" it is proposed that the strategic role of STPC will be enhanced and better ties be established between the council and Rannis. An infrastructure committee has been established that will be one of the standing committees of STPC where public policy on the structure and organisation of the research infrastructure will be set. The science committee and Technological committee should be merged. The main benefits of the merger will be increased cooperation between STPC and Rannis with the ministries that are part of the council.

Focus on research rather than innovation. In September 2012 the reorganisation of the government offices in Iceland was finished with the amalgamation of all industrial ministries into one. These changes simplify the public sector as all industries are now covered in the same ministry. This will in turn maker the coordination of all government research funds easier and more effective. There is work going on in the new Ministry of Industries and Innovation to create an employment policy for Iceland and the plan is to finish this in 2013

STPC has approved proposals to changes to the research and innovation system.

The proposals for change centre on the following issues:

- Value creation - human capital - opportunities
- Measuring quality and results - Financing innovation and science
- A simple and efficient science- and innovation system

The following table summarises the main challenges facing the innovation system and assesses the appropriateness and effectiveness of policy responses introduced in recent years.

Challenges	**Policy measures/actions addressing the challenge** [14]	**Assessment in terms of appropriateness, efficiency and effectiveness**
Low share of private R&D investments	• Introduction of a tax reduction scheme for R&D performing companies • Introduction of target for national R%D investments: 4% of GDP by 2020, with 70% coming from companies	In 2011 and 2012 about 140 legal entities made use of the scheme claiming more than 1.5 billion ISK. Assessment of the result has not been made yet but participation is widespread. The target for national R&D investments is ambitious, note least when it comes to the level of private investments. It is unclear whether the target is justified by an evidence base or public consensus.
Low level of competitive funding	• The challenge has been met, partially by the Investment Plan for Iceland 2013-2015 and the Government State Budget 2013.	According to the Investment Plan for Iceland 2013-2015 allocations to the Research Fund, The Technology Development Fund and The Strategic Research Programme are to be increased substantially. These are all competitive funds so competitive funding will increase as % of total funding.
Insufficient research prioritisation	• The challenge is addressed by proposals in STPC´s report NEW VISION-changes to the science and innovation system. • Establishment of the Strategic Research Programme in 2009. • Current focus on the creative industries. • Work begun on Industrial policy for Iceland • The Iceland 2020 sets up milestones that emphasises the	The need for increased thematic – oriented funding has been debated for several years. It has been a main issue in external reports and is addressed in the new STCP proposals. Recent introduction of thematic oriented policy measures have been welcomed. It is too early to assess the effectiveness of the measures, but they are interesting and should be followed up closely.

[14] Changes in the legislation and other initiatives not necessarily related with funding are also included.

	role of prioritisation	
Weaknesses in governance	• Strengthening of STPC operations, e.g. through more frequent meetings • Emphasis on evaluation in the STPC report NEW VISION- changes to the science and innovation system.	External experts have identified several weaknesses related to governance and have come up with a number of recommendations. Some recommendations have been taken up. Among proposals in the report NEW VISION is one for a new standing committee under STPC which has the role of making recommendations on public policy on the structure and organisation of the research infrastructure. The new report emphasizes the importance of systematic evaluations.
Focus on research rather than innovation	• Intensified support efforts in the areas of research commercialisation, entrepreneurship, design and creativity and social innovation.	The need to give higher priority to innovation has been stressed external as well as internal experts. Work is underway in this area e.g. through the new Industrial policy for Iceland, but it is too early to assess the efficiency and effectiveness of concrete initiatives.

5 NATIONAL POLICY AND THE EUROPEAN PERSPECTIVE

The Icelandic policy mix is generally well aligned with the ERA pillars and objectives. When it comes to fostering an effective labour market for researchers, challenges have emerged in the wake of the economic crisis. Icelandic policymakers are on the one hand concerned that the country has experienced an outflow of qualified human resources. On the other hand, they recognise that the weak national currency can make it difficult for researchers with Icelandic salaries to go abroad. Financial resources for researcher mobility have traditionally been scarce, but a programme offering mobility support has been established.

Iceland places a strong emphasis on international cooperation in the areas of research and innovation, and in the Strategic Research Programme international cooperation is a compulsory criterion. It is a widely held view among key stakeholders that Iceland's participation in international research infrastructures should be strengthened.

While universities and research institutes in Iceland receive most of their public funding as block funding, there is a tendency towards a more intense debate on increased use of competitive grants based on research performance assessment. There have been recommendations to restructure the university system and concentrate efforts, but so far attempts in this direction have failed.

Anexpert assessment concluded that formalised programmes supporting industry-science linkages are relatively underdeveloped in Iceland, but underlined that strong informal linkages exist (Taxell et al, 2009). The Strategic Research Programme, launched in 2009, aims to stimulate collaboration between industry and academia.

Iceland's research community participates actively in the EU FP. Instruments for internationalisation include a number of limited grants for preparation of international cooperative projects, as well as soft support for access to international funding sources (mostly from the EU). RANNIS coordinates and promotes Icelandic participation in collaborative international projects in science and technology. The European Research space is not the only focus for Icelandic science and technology policy. Iceland places great emphasis on integration in Nordic R&D co-operation programmes, including the Nordic Research and Innovation Area (NORIA).

Over the last four years Iceland has been through a tumultuous period, financially, economically and politically. A key to a successful conclusion of the various recovery initiatives is to what extent confidence in the financial and political system can be built up again. This is a key focus of the work of the centre-left government of Johanna Sigurdardottir. But through recent efforts such as the Iceland 2020 Moving Iceland Forward Initiative, the foundations are laid for meeting the challenges identified in the previous section:

- A low share of private R&D investments;
- Low levels of competitive research funding;
- Insufficient research prioritisation;
- Weaknesses in governance; and
- Focus on research rather than innovation.

Some measures and objectives are in place, as such as the tax scheme. The report of the STPC "NEW VISION – changes to the science- and innovation system" and the recommendations therein for changes and the Iceland 2020 Initiative, both point in the right directions. The new Investment Plan for Iceland 2013 -2015, with its emphasis on annual increases of contributions to the Research Fund, the Technology Development Fund and the Strategic Research Programme are steps in the right direction too, as increased funding is a prerequisite for Icelandic scientist, institutions and firms to be able to participate in international cooperation.

But the important work of developing measures and initiatives to address the objectives lies ahead. A key ingredient in the process of doing this is the relations and relative roles of the various policy institutions involved, of particular importance here are the triangular relations between the Cabinet, the STPC and RANNIS. It is important that STPC and RANNIS obtain sufficient strengths in the national policy making system that the long term objectives set are given sufficient emphasis relevant to short term challenges and recovery needs. Proposals in that direction are made in the NEW Vision report.

The regionalisation outlined in the Innovation 2020 Initiative, and the consolidation of the college and university sector is interesting. This requires efficient and effective relations between national and regional actors and authorities. That work is under way as the first regional plans of action are being prepared in all 8 regions. In preparation for that work the regions have been offered expert advice through the IPA programme.

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LIST OF ABBREVIATIONS

BERD	Business Expenditures for Research and Development
COST	European Cooperation in Science and Technology
EEA	European Economic Area
EFTA	European Free Trade Agreement
EU	European Union
EU 27	European Union including 27 Member States
FP7	7th Framework Programme
FTE	Full Time Equivalent
GBAORD	Government Budget Appropriations or Outlays on R&D
GDP	Gross Domestic Product
GERD	Gross Domestic Expenditure on R&D
HEI	Higher Education Institutions
HERD	Higher Education Expenditure on R&D
HRST	Human Resources in Science and Technology
ICI	Innovation Center Iceland (Nýsköpunarmiðstöð Íslands)
IPA	Instrument for Pre-Accession Assistance
ISK	Icelandic króna
IUS	Innovation Union Scoreboard
LL	Iceland Living Lab
NORIA	Nordic Research and Innovation Area
OECD	Organisation for Economic Co-operation and Development
PPS	Purchasing Power Standards
R&D	Research and Development
R&D&I	Research and Development and Innovation
RANNIS	Iceland Centre for Research
RIS_3	Research and Innovation Strategies on Smart Specialisation
RTDI	Research Technological Development and Innovation
S&T	Science and Technology
STI	Science Technology Innovation
STPC	Science and Technology Policy Council

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Abstract
This analytical country report is one of a series of annual ERAWATCH reports produced for EU Member States and Countries Associated to the Seventh Framework Programme for Research of the European Union (FP7). The main objective of the ERAWATCH Annual Country Reports is to characterise and assess the performance of national research systems and related policies in a structured manner that is comparable across countries.
The Country Report 2012 builds on and updates the 2011 edition. The report identifies the structural challenges of the national research and innovation system and assesses the match between the national priorities and the structural challenges, highlighting the latest developments, their dynamics and impact in the overall national context. They further analyse and assess the ability of the policy mix in place to consistently and efficiently tackle these challenges. These reports were originally produced in December 2012, focusing on policy developments over the previous twelve months.
The reports were produced by independent experts under direct contract with IPTS. The analytical framework and the structure of the reports have been developed by the Institute for Prospective Technological Studies of the Joint Research Centre (JRC-IPTS) and Directorate General for Research and Innovation with contributions from external experts.

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Key policy areas include: environment and climate change; energy and transport; agriculture and food security; health and consumer protection; information society and digital agenda; safety and security including nuclear; all supported through a cross-cutting and multi-disciplinary approach.

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